

Proposed Syllabus and Scheme of Examination

for

B.A. Program

Computer Applications

Under

Choice Based Credit System

Department of Computer Science

Himachal Pradesh University

Shimla

June 2016

CHOICE BASED CREDIT SYSTEM

B.A. Program with Computer Applications Course Structure

Details of courses under B.A. Program with Computer Applications

Course	*Credits	Theory + Practical	Theory + Tutorial
I. Core Course			
(12Papers)		12X4=48	12X5=60
Two papers – English			
Two papers – MIL			
Four papers – Discipline 1			
Four papers – Discipline 2			
Core Course Practical/Tutorial*			
(12 Practical)		12X2=24	12X1=12
II. Elective Course			
(6 Papers)		6X4=24	6X5=30
Two papers- Discipline 1 specific			
Two papers- Discipline 2 specific			
Two papers- Inter disciplinary			
Two papers from each discipline of choice and two papers of interdisciplinary nature			
Elective Course Practical / Tutorials*		6X2=12	6X1=6
(6 Practical / Tutorials*)			
Two papers- Discipline 1 specific			
Two papers- Discipline 2 specific			
Two papers- Generic (Inter disciplinary)			
Two papers from each discipline of choice including papers of interdisciplinary nature			
III. Ability Enhancement Courses			
1. Ability Enhancement Compulsory Courses (AECC)			
(2 Papers of 4 credit each)		2X4=8	2X4=8
Environmental Science			
English Communication /MIL			
2. Skill Enhancement Courses (SEC)			
(Minimum2)		4X4=16	4X4=16
(4 Papers of 4 credits each)			
Total credit		132	132

*Wherever there is a practical there will be no tutorial and vice-versa

PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN

B. A. Program (Computer Application)

SE ME ST ER	CORE COURSE (12)	Ability Enhancement Compulsory Course(AECC)(2)	Skill Enhance- ment Course (SEC)(4)	Elective: Discipline Specific DSE (4)	Generic Elective GE (2)
I	English/MIL-1	(English/MIL Communication)/Environmental Science			
	DSC -1A- Computer Fundamentals (4 + 4)				
	DSC – 2A				
II	English/MIL-1	Environment al Science/ (English/MIL Communication)			
	DSC -1B- Database Management Systems (4 + 4)				
	DSC – 2B				
III	English/MIL-2		SEC – 1 - Office Automation Tools		
	DSC -1C- Computer Networks and Internet Technologies (4 + 4)				
	DSC – 2C				
IV	English/MIL-2		SEC – 2 - Search Engine Optimization		
	DSC -1D- Multimedia Systems and Applications (4 + 4)				
	DSC – 2D				

V			SEC – 3A - Open Source Software	DSE – 1A- Programming with Python(4+4)	GE -1 - IT Fundamentals (4+4) or any Discipline specific core paper
			SEC – 3B - Introduction to Linux	DSE – 1B – Visual Programming (4+4)	
			SEC – 4A – Web Design using HTML5	DSE – 2A- Information Security and Cyber Laws(4+4)	GE -2 - Multimedia and Web Design (4+4) or any Discipline specific core paper
			SEC – 4B – PHP Programming	DSE – 2B - Software Engineering (4+4)	
			SEC – 4C – Programming using C++		

PROPOSED SCHEME FOR CHOICE BASED CREDIT SYSTEM IN
B. A. Program (Computer Application)

Core Course(DSC)=14 *Credits(DSC) Theory + Practical/Tutorial= 6 each	Ability Enhancement Course (AESCC) =2 *Credits(AECC)= 4 each	Skill Enhancement Course (SEC)=4 *Credits(SEC) Theory + Practical/ Tutorial = 4each	Elective: Discipline Specific (DSE)=4 *Credits(DSE) Theory + Practical/ Tutorial = 6 each	Elective : Generic (GE)=2 *Credits(DSE) Theory + Practical/ Tutorial = 6 each	Total No. of courses per Semester	Total Credits earned per Semester
1st Semester English/MIL-1 DSC-1A <i>Computer Fundamentals</i> (4+4) DSE -2A (Paper from Discipline 2)	English				DSC =3 AECC=1 <hr/> 4	DSC=3*6=18 AECC=1*2=4 <hr/> 22 Credits Earned by Computer Subjects=6
2nd Semester English/MIL-1 DSC -1B-Database Management Systems (4 + 4) DSC -2B (Paper from Discipline 2)	Environmental Science				DSC = 3 AECC=1 <hr/> 4	DSC=3*6=18 AECC=1*2=4 <hr/> 22 Credits Earned by Computer Subjects=6

3rd Semester		SEC -1 <i>Office Automation Tools</i> [3/4+2 lab/ 1 Tutorial]			DSC=3 SEC =1 <hr/> 4	DSC=3*6=18 SEC=1*4=4 <hr/> 22 Credits Earned by Computer Subjects=10
4th Semester		SEC – 2 <i>Search Engine Optimization</i> [3/4+2 lab/ 1 Tutorial]			DSC = 3 SEC =1 <hr/> 4	DSC=3*6=18 SEC=1*2=4 <hr/> 22 Credits Earned by Computer Subjects=10
5th Semester		SEC – 3A <i>Open Source Software</i> [3/4+2 lab/ 1 Tutorial] OR SEC – 3B <i>Introduction to Linux</i> [3/4+2 lab/ 1 Tutorial]	DSE – 1A <i>Programming with Python(4+4)</i> OR DSE – 1B <i>Visual Programming (4+4)</i> DSE (Paper from Discipline 2)	GE -1 Paper from any other Discipline other than Computer Applications and Discipline 2	SEC=1 DSE=2 GE=1 <hr/> 4	SEC=1*4=4 DSE=2*6=12 GE=1*6=6 <hr/> 22 Credits Earned by Computer Subjects=10
6th Semester		SEC – 4B <i>Web Designing 2) Using HTML 5</i> OR SEC – 4B <i>PHP Programming</i> [3/4+2 lab/ 1 Tutorial] OR SEC-4C <i>Programming Using C++</i>	DSE – 2A <i>Information Security and Cyber Laws</i> OR DSE-2B <i>Software Engineering (4+4)</i> DSE (Paper from Discipline 2)	GE -2 Paper from any other Discipline other than Computer Applications and Discipline 2	SEC=1 DSE=1 GE=1 <hr/> 4	SEC=1*4=4 DSE=2*6=12 GE=1*6=6 <hr/> 22 Credits Earned by Computer Subjects=10

Total credits earned in all semesters (in all subjects)=22+22+22+22+22+22=132 credits

Total credits earned through Computer Science in all semesters=6+6+10+10+10+10=52 credits

Total credits earned through Computer Science in odd semesters (I+III+V) =6+10+16=52 credits

Total credits earned through Computer Science in even semesters (II+IV+VI) =6+10+16=26 credits

=> Number of Assistant Prof. (Computer Application) required to run the course=02

- Practical / Tutorial are with every core and discipline/ Generic specific papers.
- Whenever there is practical there will be no tutorials and vice versa.
- No. of Practical=4 periods / week for Practical of 2 credits. No. of Tutorial=1 Period / week for Tutorial of 1 credit.
- Credits for Core Course Paper (DSC) = (i) Theory [4 credits] (4 Period / week) + Practical [2 credit] (4 Period / week) = Total Six (06) credits and Total Eight (8) periods/week.
(ii) Theory [5 credits] (5 Period / week) +Tutorial [1 credit] (1 Period / week) = Total Six (06) credits and Total Six (6) periods/week.
- Size of Practical group for practical papers is recommended to be 10-15 students whereas the size of tutorial group for papers is recommended to be 8-10 students.

SEM ES TER	COURSE OPTED	COURSE NAME	CRE DITS	COURSE	ESE (THEORY)	CCA (IA)	TOTAL MARK S
I	Ability Enhancement Compulsory Course-I	English/MIL communications/Environmental Science	4		80	20	100
	Core course-I	English/MIL-1	6		80	20	100
	Core Course-II	DSC -1A-Computer Fundamentals	4	BACS101	80	20	100
	Core course-II Practical/Tutorial	DSC -1A-Computer Fundamentals Lab	2	BACS101P	80	20	100
	Core Course-III	DSC 2A	6		80	20	100
II	Ability Enhancement Compulsory Course-II	English/MIL communications/Environmental Science	4		80	20	100
	Core course-IV	English/MIL-1	6		80	20	100
	Core Course-V	DSC -1B-Database Management	4	BACS201	80	20	100
	Core course-V Practical/Tutorial	DSC -1B -Database Management Systems Lab	2	BACS201P	80	20	100
	Core Course-VI	DSC 2B	6		80	20	100
III	Core course-VII	English/MIL-2	6		80	20	100
	Core Course-VIII	DSC-1C-Computer Networks and Internet Technologies	4	BACS301	80	20	100
	Core course-VIII Practical/Tutorial	DSC -1C-Computer Networks and Internet Technologies Lab	2	BACS301P	80	20	100
	Core Course-IX	DSC 2C	6		80	20	100
	Skill Enhancement Course-1 (Theory + Practical/Tutorial)	SEC-1- Office Automation Tools	4	BACS302	80	20	100
IV	Core course-X	English/MIL-2	6		80	20	100
	Course-XI	DSC -1D-Multimedia Systems and Applications	4	BACS401	80	20	100
	Core course-XI Practical/Tutorial	DSC -1D-Multimedia Systems and Applications Lab	2	BACS401P	80	20	100
	Course-XII	DSC 2D	6		80	20	100
	Skill Enhancement Course-2 (Theory+ Practical/Tutorial)	SEC-2Search Engine Optimization	4	BACS402	80	20	100
V	Skill Enhancement Course-3A (Theory+ Practical/Tutorial)	SEC-3A - Open Source Software	4	BACS501	80	20	100

OR <i>*Choice for SEC Paper</i>						
Skill Enhancement Course-3B (Theory+ Practical/Tutorial)	SEC-3B - Introduction to Linux	4	BACS502	80	20	100
<i>*DSE Paper</i>						
Discipline Specific Elective -1A	DSE-1A - Programming with Python	4	BACS503	80	20	100
Discipline Specific Elective -1A Practical/Tutorial	DSE-1A - Programming with Python Lab	2	BACS503P	80	20	100
OR <i>*Choice for DSE Paper</i>						
Discipline Specific Elective -1B	DSE-1B – Visual Programming	4	BACS504	80	20	100
Discipline Specific Elective -1B Practical/Tutorial	DSE-1B - Visual Programming Lab	2	BACS504 P	80	20	100
Discipline Specific Elective (Paper from Discipline 2)	Practical/Tutorial (Paper from Discipline 2)	4/5		80	20	100
Discipline Specific Elective Practical/Tutorial (Paper from Discipline 2)	Practical/Tutorial (Paper from Discipline 2)	2/1		80	20	100
Generic Elective – 1 (Paper from other discipline)	GE – 1 (Interdisciplinary Paper)	4		80	20	100
Generic Elective – 1 Practical/Tutorial	GE – 1 – Lab	2		80	20	100
VI	Skill Enhancement Course -4A (Theory + Practical/Tutorial)	4	BACS601	80	20	100
OR <i>*Choice for SEC Paper</i>						
Skill Enhancement Course -4B (Theory + Practical/Tutorial)	SEC-4B - PHP Programming	4	BACS602	80	20	100
OR <i>*Choice for SEC Paper</i>						
Skill Enhancement Course -4C (Theory +Practical/Tutorial)	SEC-4C - Programming using C++	4	BACS603	80	20	100
<i>*DSE Paper</i>						
Discipline Specific Elective -2A	DSE-2A - Information Security and Cyber Laws	4	BACS604	80	20	100

Discipline Specific Elective -2A Practical/Tutorial	DSE-2A - Information Security and Cyber Laws Lab	2	BACS604P	80	20	100
OR *Choice for DSE Paper						
Discipline Specific Elective -2B	DSE-2B - Software Engineering	4	BACS605	80	20	100
Discipline Specific Elective -2B Practical/Tutorial	DSE-2B - Software Engineering Lab	2	BACS605P	80	20	100
Discipline Specific Elective (Paper from Discipline 2)	DSE Paper from Discipline 2	4/5		80	20	100
Discipline Specific Elective Practical/Tutorial (Paper from Discipline 2)	Practical/Tutorial (Paper from Discipline 2)	2/1		80	20	100
Generic Elective –2 (Paper from other discipline)	GE – 2 (Interdisciplinary Paper)	4		80	20	100
Generic Elective –2 Practical/Tutorial	GE – 2 – Lab	2		80	20	100
Total Credits		132				

Core Papers: Computer Applications (Credit: 06 each) (DSC-1/2)(1 period / week for tutorials or 4 periods / week of practical) : All Compulsory from Semester I to IV one paper each.

- | | | |
|--|---------------|--------------------|
| 1. Computer Fundamentals | Paper:BACS101 | (4 Theory + 4 Lab) |
| 2. Database Management Systems | Paper:BACS102 | (4 Theory + 4 Lab) |
| 3. Computer Networks and Internet Technologies | Paper:BACS103 | (4 Theory + 4 Lab) |
| 4. Multimedia Systems and Applications | Paper:BACS104 | (4 Theory + 4 Lab) |

Discipline Specific Elective Papers: (Credit: 06 each) (DSE-1, DSE -2):

Options for DSE 1, choose one

- | | | |
|----------------------------------|---------------|--------------------|
| 1.DSE-1A Programming with Python | Paper:BACS503 | (4 Theory + 4 Lab) |
| 2.DSE-1B Visual Programming | Paper:BACS504 | (4 Theory + 4 Lab) |

Options for DSE 2 , choose one

- | | | |
|--|---------------|--------------------|
| 1.DSE-2A Information Security and Cyber Laws | Paper:BACS604 | (4 Theory + 4 Lab) |
| 2.DSE-2B Software Engineering | Paper:BACS605 | (4 Theory + 4 Lab) |

Skill Enhancement Courses (any four) (Credit: 02 each) – SEC1 to SEC4: Choose one each from Semester III to Semester VI

- | | | |
|-------------------------------------|---------------|--------------------------------|
| 1. SEC-1 Office Automation Tools | Paper:BACS302 | (3Theory + 2 Lab/ 1 Tutorial) |
| 2. SEC-2 Search Engine Optimization | Paper:BACS402 | (3 Theory + 2 Lab/ 1 Tutorial) |

Options for SEC-3, choose one

- | | | |
|---------------------------------|---------------|--------------------------------|
| 3. SEC-3A Open Source Software | Paper:BACS501 | (3Theory + 2 Lab/ 1 Tutorial) |
| 4. SEC-3B Introduction to Linux | Paper:BACS502 | (3 Theory + 2 Lab/ 1 Tutorial) |

Options for SEC-4, choose one

- | | | |
|---------------------------------|----------------|--------------------------------|
| 5. SEC-4A Web Design using HTML | Paper:BACS601 | (3 Theory + 2 Lab/ 1 Tutorial) |
| 6. SEC-4B PHP Programming | Paper: BACS602 | (3 Theory + 2 Lab/ 1 Tutorial) |
| 7. SEC-4C Programming using C++ | Paper: BACS603 | (3 Theory + 2 Lab/ 1 Tutorial) |

Note: Universities may include more options or delete some from this list

General Elective for other Discipline (Two papers of anyone discipline in Semester V and VI) – GE 1 and GE 2

- | | | |
|-----------------------------------|---------------|--------------------|
| 1. GE-1 IT Fundamentals | Paper:BACS505 | (4 Theory + 4 Lab) |
| 2. GE-2 Multimedia and Web Design | Paper:BACS606 | (4 Theory + 4 Lab) |

Core Papers: Computer Applications (Credit: 06 each)
(DSC-1/2) (4Theory + 4Lab)

Core Paper I :Semester-I:
DSC-1A Computer Fundamentals
Paper BACS101

Theory: 60 Lectures

Unit-1

Introduction: Introduction to computer system, uses, types.

Data Representation: Number systems and character representation, binary arithmetic

Human Computer Interface: Types of software, Operating system as user interface, utility programs **(15 Lectures)**

Unit-2

Devices: Input and output devices (with connections and practical demo), keyboard, mouse, joystick, scanner, OCR, OMR, bar code reader, web camera, monitor, printer, plotter **(8 Lectures)**

Memory: Primary, secondary, auxiliary memory, RAM, ROM, cache memory, hard disks, optical disks **(7 Lectures)**

Unit-3

Computer Organisation and Architecture: C.P.U., registers, system bus, main memory unit, cache memory, Inside a computer, SMPS, Motherboard, Ports and Interfaces, expansion cards, ribbon cables, memory chips, processors. **(15 Lectures)**

Unit-4

Overview of Emerging Technologies: Bluetooth, cloud computing, big data, data mining, mobile computing and embedded systems. **(8 Lectures)**

Use of Computers in Education and Research: Data analysis, Heterogeneous storage, e-Library, Google Scholar, Domain specific packages such as SPSS, Mathematica etc. **(7 Lectures)**

Practical:

Paper: BACS101P

The practical assignment must include connecting parts of a computer and assembling it to an extent, media formatting and installation of some software.

Practical exercises based on Open Office tools using document preparation and spreadsheet handling packages.

Text Editor

1. Prepare a **grocery list** having four columns (Serial number, The name of the product, quantity and price) for the month of April, 06.
 - Font specifications for Title (Grocery List): 14-point Arial font in bold and italics.
 - The headings of the columns should be in 12-point and bold.
 - The rest of the document should be in 10-point Times New Roman.
 - Leave a gap of 12-points after the title.
2. Create a **telephone directory**.
 - The heading should be 16-point Arial Font in bold • The rest of the document should use 10-point font size
 - Other headings should use 10-point Courier New Font.
 - The footer should show the page number as well as the date last updated.
3. Design a **time-tableform** for your college.
 - The first line should mention the name of the college in 16-point Arial Font and should be bold.
 - The second line should give the course name/teacher's name and the department in 14-point Arial.
 - Leave a gap of 12-points.
 - The rest of the document should use 10-point Times New Roman font.
 - The footer should contain your specifications as the designer and date of creation.
4. BPB Publications plans to release a new book designed as per your syllabus. Design the **first page of the book** as per the given specifications.
 - The title of the book should appear in bold using 20-point Arial font.
 - The name of the author and his qualifications should be in the center of the page in 16-point Arial font.

- At the bottom of the document should be the name of the publisher and address in 16-point Times New Roman.
- The details of the offices of the publisher (only location) should appear in the footer.

5. Create the following one page documents.

- Compose a note inviting friends to a get-together at your house, Including a list of things to bring with them.
- Design a certificate in landscape orientation with a border around the document.
- c.Design a Garage Sale sign.
- Make a sign outlining your rules for your bedroom at home, using a numbered list.

6. Create the following documents:

- A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.
- Use a newsletter format to promote upcoming projects or events in your classroom or college.

7. Convert following text to a table, using comma as delimiter

Type the following as shown (do not bold). **Color, Style, Item**
Blue, A980, Van
Red, X023, Car
Green, YL724, Truck
Name, Age, Sex
Bob, 23, M
Linda, 46, F
Tom, 29, M

8. Enter the following data into a table given on the next page.

Salesperson	Dolls	Trucks	Puzzles
Kennedy, Sally	1327	1423	1193
White, Pete	1421	3863	2934
Pillar, James	5214	3247	5467
York, George	2190	1278	1928

Banks, Jennifer	1201	2528	1203
Atwater, Kelly	4098	3079	2067

Add a column Region (values: S, N, N,S,S,S) between the Salesperson and Dolls columns to the given table
Sort your table data by Region and within Region by Salesperson in ascending order:

In this exercise, you will add a new row to your table, place the word "Total" at the bottom of the Salesperson column, and sum the Dolls, Trucks, and Puzzles columns.

9. Wrapping of text around the image.
10. Create your resume by incorporating most of the options learned till now.
11. Following features of menu option must be covered

FILE	Complete menu
EDIT	Complete menu
VIEW	Complete menu
INSERT	Complete menu
FORMAT	Complete menu
TABLE	Complete menu
WINDOW	Complete menu
HELP	Complete menu
TOOLS	All options except Online collaboration, Tools on Macro, Templates

Spreadsheet

1. Enter the Following data in Excel Sheet

REGIONAL SALES PROJECTION

State	Qtr1	Qtr2	Qtr3	QTR4	Qtr	Total	Rate	Amount	Delhi	2020	2400	2100	3000	15
Punjab	1100	1300	1500	1400					20					
U.P.	3000	3200	2600	2800	17	Harayana	1800	2000	2200	2700	15	Rajasthan		
	2100	2000	1800	2200	20									

TOTAL AVERAGE

- (a) Apply Formatting as follow:
 - i. Title in TIMES NEW ROMAN
 - ii. Font Size – 14
 - iii. Remaining text - ARIAL, Font Size -10
 - iv. State names and Qtr. Heading Bold, Italic with Gray Fill Color.
 - v. Numbers in two decimal places
 - vi. Qtr. Heading in center Alignment.

vii. Apply Border to whole data.

(b) Calculate State and Qtr. Total (c)

Calculate Average for each quarter (d)

Calculate Amount = Rate * Total.

2. Given the following worksheet

	A	B	C	D
1	Roll No.	Name	Marks	Grade
2	1001	Sachin	99	
3	1002	Sehwag	65	
4	1003	Rahul	41	
5	1004	Sourav	89	
6	1005	Har Bhajan	56	

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
≥ 80	A+
$\geq 60 < 80$	A
$\geq 50 < 60$	B
< 50	F

3. Given the following worksheet

	A	B	C	D	E	F	G	
1	Salesman		Sales in (Rs.)					
2	No.	Qtr1	Qtr2	Qtr3	Qtr4	Total	Commission	
3	S001	5000	8500	12000	9000			
4	S002	7000	4000	7500	11000			
5	S003	4000	9000	6500	8200			
6	S004	5500	6900	4500	10500			
7	S005	7400	8500	9200	8300			
8	S006	5300	7600	9800	6100			

Calculate the commission earned by the salesmen on the basis of following Candidates:

If Total Sales	Commission
< 20000	0% of sales
> 20000 and < 25000	4% of sales
> 25000 and < 30000	5.5% of sales
> 30000 and < 35000	8% of sales
≥ 35000	11% of sales

The total sale is sum of sales of all the four quarters.

4. A company XYZ Ltd. pays a monthly salary to its employees which consists of basic salary, allowances & deductions. The details of allowances and deductions are as follows:

Allowances

- HRA Dependent on Basic
30% of Basic if Basic ≤ 1000
25% of Basic if Basic > 1000 & Basic ≤ 3000
20% of Basic if Basic > 3000

- DA Fixed for all employees, 30% of Basic
- Conveyance Allowance Rs. 50/- if Basic is ≤ 1000
Rs. 75/- if Basic > 1000 & Basic ≤ 2000
Rs. 100 if Basic > 2000
- Entertainment Allowance NIL if Basic is ≤ 1000
Rs. 100/- if Basic > 1000

Deductions

- Provident Fund 6% of Basic
- Group Insurance Premium Rs. 40/- if Basic is ≤ 1500
Rs. 60/- if Basic > 1500 & Basic ≤ 3000
Rs. 80/- if Basic > 3000

Calculate the following:

Gross Salary = Basic + HRA + DA + Conveyance + Entertainment

Total deduction = Provident Fund + Group Insurance Premium

Net Salary = Gross Salary – Total Deduction

5. Create Payment Table for a fixed Principal amount, variable rate of interests and time in the format below:

No. of Instalments	5%	6%	7%	8%	9%
3		XX	XX	XX	XX
4		XX	XX	XX	XX
5		XX	XX	XX	XX
6		XX	XX	XX	XX

6. Use an array formula to calculate Simple Interest for given principal amounts given the rate of Interest and time

Rate of Interest 8%

Time 5 Years

Principal	Simple Interest
1000	?
18000	?
5200	?

7. The following table gives year wise sale figure of five salesmen in Rs.

Salesman	2000	2001	2002	2003
S1	10000	12000	20000	50000
S2	15000	18000	50000	60000
S3	20000	22000	70000	70000
S4	30000	30000	100000	80000
S5	40000	45000	125000	90000

- Calculate total sale year wise.
- Calculate the net sale made by each salesman
- Calculate the maximum sale made by the salesman
- Calculate the commission for each salesman under the condition.

(i) If total sales $> 4,00,000$ give 5% commission on total sale made by the salesman. (ii)

Otherwise give 2% commission.

- Draw a bar graph representing the sale made by each salesman.
- Draw a pie graph representing the sale made by salesman in 2000.

8. Enter the following data in Excel Sheet

PERSONAL BUDGET FOR FIRST QUARTER

Monthly Income (Net): 1,475

EXPENSES	JAN	FEB	MARCH	QUARTER	QUARTER
		TOTAL	AVERAGE		
Rent	600.00	600.00	600.00		
Telephone	48.25	43.50	60.00		
Utilities	67.27	110.00	70.00		
Credit Card	200.00	110.00	70.00		
Oil	100.00	150.00	90.00		
AV to Insurance	150.00				
Cable TV	40.75	40.75	40.75		
Monthly Total					

- Calculate Quarter total and Quarter average.
- Calculate Monthly total.
- Surplus = Monthly income - Monthly total.
- What would be total surplus if monthly income is 1500.
- How much does telephone expense for March differ from quarter average.
- Create a 3D column graph for telephone and utilities.
- (g) Create a pie chart for monthly expenses.

9. Enter the following data in Excel Sheet

TOTAL REVENUE EARNED FOR SAM'S BOOKSTALL

Publisher name	1997	1998	1999	2000	total
A	Rs. 1,000.00	Rs. 1100.00	Rs. 1,300.00	Rs. 800.00	
B	Rs. 1,500.00	Rs. 700.00	Rs. 1,000.00	Rs. 2,000.00	
C	Rs. 700.00	Rs. 900.00	Rs. 1,500.00	Rs. 600.00	
D	Rs. 1,200.00	Rs. 500.00	Rs. 200.00	Rs. 1,100.00	
E	Rs. 800.00	Rs. 1,000.00	Rs. 3,000.00	Rs. 560.00	

- Compute the total revenue earned.
- Plot the line chart to compare the revenue of all publisher for 4 years.
- Chart Title should be 'Total Revenue of sam's Bookstall (1997-2000)'
- Give appropriate categories and value axis title.

10. Generate 25 random numbers between 0 & 100 and find their sum, average and count. How many no. are in range 50-60

Core Paper II: Semester – II: DSC-2A
Database Management System
Paper: BACS201

Theory: 60 Lectures

Unit-1

Database: Introduction to database, relational data model, DBMS architecture, data independence, DBA, database users, end users, front end tools **(15 Lectures)**

Unit-2

E-R Modeling: Entity types, entity set, attribute and key, relationships, relation types, E- R diagrams, database design using ER diagrams **(15 Lectures)**

Unit-3

Relational Data Model: Relational model concepts, relational constraints, primary and foreign key, normalization: 1NF, 2NF, 3NF**(15 Lectures)**

Unit-4

Structured Query Language: SQL queries, create a database table, create relationships between database tables, modify and manage tables, queries, forms, reports, modify, filter and view data. **(15 Lectures)**

Reference Books:

1. P. Rob, C. Coronel, Database System Concepts by, Cengage Learning India, 2008
2. R. Elmsasri,S. Navathe Fundamentals of Database Systems, Pearson Education, Fifth Edition, 2007
3. MySQL : Reference Manual

Practical:

Paper: BACS201P

Practical List

- I)* Create a database having two tables with the specified fields, to computerize a library system of a Delhi University College.

LibraryBooks (Accession number, Title, Author, Department, PurchaseDate, Price)

IssuedBooks (Accession number, Borrower)

- a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
- b) Delete the record of book titled “Database System Concepts”.
- c) Change the Department of the book titled “Discrete Maths” to “CS”.
- d) List all books that belong to “CS” department.
- e) List all books that belong to “CS” department and are written by author “Navathe”.

- f) List all computer (Department="CS") that have been issued.
 - g) List all books which have a price less than 500 or purchased between "01/01/1999" and "01/01/2004".
- 2) Create a database having three tables to store the details of students of Computer Department in your college.

Personal information about Student (College roll number, Name of student, Date of birth, Address, Marks(rounded off to whole number) in percentage at 10 + 2, Phone number)
Paper Details (Paper code, Name of the Paper)

Student's Academic and Attendance details (College roll number, Paper code, Attendance, Marks in home examination).

- a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
 - b) Design a query that will return the records (from the second table) along with the name of student from the first table, related to students who have more than 75% attendance and more than 60% marks in paper 2.
 - c) List all students who live in "Delhi" and have marks greater than 60 in paper 1.
 - d) Find the total attendance and total marks obtained by each student.
 - e) List the name of student who has got the highest marks in paper 2.
- 3) Create the following tables and answer the queries given below:

Customer (CustID, email, Name, Phone, ReferrerID)

Bicycle (BicycleID, DatePurchased, Color, CustID, ModelNo)

BicycleModel (ModelNo, Manufacturer, Style)

Service (StartDate, BicycleID, EndDate)

- a) Identify primary and foreign keys. Create the tables and insert at least 5 records in each table.
 - b) List all the customers who have the bicycles manufactured by manufacturer "Honda".
 - c) List the bicycles purchased by the customers who have been referred by customer "C1".
 - d) List the manufacturer of red colored bicycles.
 - e) List the models of the bicycles given for service.
- 4) Create the following tables, enter at least 5 records in each table and answer the queries given below.

EMPLOYEE (Person_Name, Street, City)

WORKS (Person_Name, Company_Name, Salary)

COMPANY (Company_Name, City)

MANAGES (Person_Name, Manager_Name)

- a) Identify primary and foreign keys.
 - b) Alter table employee, add a column "email" of type varchar(20).
 - c) Find the name of all managers who work for both Samba Bank and NCB Bank.
 - d) Find the names, street address and cities of residence and salary of all employees who work for "Samba Bank" and earn more than \$10,000.
 - e) Find the names of all employees who live in the same city as the company for which they work.
 - f) Find the highest salary, lowest salary and average salary paid by each company.
 - g) Find the sum of salary and number of employees in each company.
 - h) Find the name of the company that pays highest salary.
- 5) Create the following tables, enter at least 5 records in each table and answer the queries given below.

Suppliers (SNo, Sname, Status, SCity)

Parts (PNo, Pname, Colour, Weight, City)

Project (JNo, Jname, Jcity)

Shipment (Sno, Pno, Jno, Qunatity)

- a) Identify primary and foreign keys.
- b) Get supplier numbers for suppliers in Paris with status>20.
- c) Get suppliers details for suppliers who supply part P2. Display the supplier list in increasing order of supplier numbers.
- d) Get suppliers names for suppliers who do not supply part P2.
- e) For each shipment get full shipment details, including total shipment weights.
- f) Get all the shipments where the quantity is in the range 300 to 750 inclusive.
- g) Get part nos. for parts that either weigh more than 16 pounds or are supplied by suppliers S2, or both.
- h) Get the names of cities that store more than five red parts.
- i) Get full details of parts supplied by a supplier in Delhi.
- j) Get part numbers for part supplied by a supplier in Allahabad to a project in Chennai.
- k) Get the total number of project supplied by a supplier (say, S1).
- l) Get the total quantity of a part (say, P1) supplied by a supplier (say, S1).

Core Paper III: Semester III:

DSC-3A Computer Networks and Internet Technologies

Paper: BACS301

Theory: 60 Lectures

Unit-1

Computer Networks: Introduction to computer network, data communication, components of data communication, data transmission mode, data communication measurement, LAN, MAN, WAN, wireless LAN, internet, intranet, extranet. **(8 Lectures)**

Network Models: Client/ server network and Peer-to-peer network, OSI, TCP/IP, layers and functionalities. **(7 Lectures)**

Unit-2

Transmission Media: Introduction, Guided Media: Twisted pair, Coaxial cable, Optical fiber. Unguided media: Microwave, Radio frequency propagation, Satellite. **(7Lectures)**

LAN Topologies: Ring, bus, star, mesh and tree topologies. **(8 Lectures)**

Unit-3

Network Devices: NIC, repeaters, hub, bridge, switch, gateway and router. **(5 Lectures)**

Internet Terms: Web page, Home page, website, internet browsers, URL, Hypertext, ISP, Web server, download and upload, online and offline. **(5 Lectures)**

Internet Applications: www, telnet, ftp, e-mail, social networks, search engines, Video Conferencing, e-Commerce, m-Commerce, VOIP, blogs. **(5 Lectures)**

Unit-4

Introduction to Web Design: Introduction to hypertext markup language (html) Document type definition, creating web pages, lists, hyperlinks, tables, web forms, inserting images, frames, hosting options and domain name registration. Customized Features: Cascading style sheet (css) for text formatting and other manipulations. **(15 Lectures)**

Reference Books:

1. Andrew S. Tanenbaum, David J. Wetherall Computer Networks (5th Edition), PHI, 2010
2. B. A. Forouzan, Data Communication and Networking, TMH, 2003.
3. D.R. Brooks, An Introduction to HTML and Javascript for Scientists and Engineers, Springer
4. HTML A Beginner's Guide, Tata McGraw-Hill Education, 2009.
5. J. A. Ramalho, Learn Advanced HTML 4.0 with DHTML, BPB Publications, 2007

Practical

Paper: BACS301P

Networking exercises in a trial lab, where effects of different connectors, topologies in practical could be demonstrated.

Before moving to JavaScript practicals, students must get an idea about fundamental programming using Scratch (<https://scratch.mit.edu>). Students should be encouraged to learn Scratch on their own and work on assignments available online such as <https://sites.google.com/site/christopherscfahs/scratch-programming/scratch-assignments> or <http://scratched.gse.harvard.edu/resources/uw-catapult-project> .

Alternatively, students may use Alice (<http://www.alice.org/index.php>) and learn basic programming. A lot of online assignments and spoken tutorials on YouTube would be helpful.

Practical exercises based on concepts listed in theory using HTML.

1. Create HTML document with following formatting – Bold, Italics, Underline, Colors, Headings, Title, Font and Font Width, Background, Paragraph, Line Brakes, Horizontal Line, Blinking text as well as marquee text.
2. Create HTML document with Ordered and Unordered lists, Inserting Images, Internal and External linking
3. Create HTML document with Table:

--	--	--	--	--

	Some image here

4. Create Form with Input Type, Select and Text Area in HTML.
5. Create an HTML containing Roll No., student's name and Grades in a tabular form.
6. Create an HTML document (having two frames) which will appear as follows:

<p>About</p> <p>Department 1</p> <p>Department 2</p> <p>Department 3</p>	<p>This frame would show the contents according to the link clicked by the user on the left frame.</p>
---	--

7. Create an HTML document containing horizontal frames as follows:

Department Names (could be along with Logos)
Contents according to the Link clicked

8. Create a website of 6 – 7 pages with different effects as mentioned in above problems.
9. Create HTML documents (having multiple frames) in the following three formats:

Frame1
Frame2

Frame1	
Frame2	Frame3

10. Create a form using HTML which has the following types of controls:
 - I. Text Box
 - II. Option/radio buttons
 - III. Check boxes

IV. Reset and Submit buttons

Subscribe to XYZ News Magazine and Emails

Interested in receiving daily small updates of all latest News? Well, now you can. And best of all, it is free! Just fill out this form and submit it by clicking the "send it In" button. We will put you on our mailing list and you will receive your first email in 3-5 days.

Please fill the following boxes to help us send the emails and our news letter:

First Name:

Last Name:

Business:

We must have a correct e-mail address to send you the news letter:

Email:

How did you hear about XYZ News Magazine and Emails?

Here on the Web In a magazine Television Other

Would you like to be on our regular mailing list?

Yes, we love junk emails

List of Practicals using Scratch : (self-learning by students)

- Join the Scratch community on scratch.mit.edu. Explore featured projects and modify any one of them.
- Create a game using SCRATCH similar to that of Beach Baby Volleyball. The game MUST meet the following objectives.
 - Have at least 3 sprites. All of which move, bounce, fall, etc. 10 pts.
 - Edit at least one of the sprites in some way to make it your own. 10 pts.
 - Make some or all sprites move with the use of certain keys. 15 pts.
 - Create or use a given background on your game. 10 pts.
 - Incorporate sound into your game. 10 pts.
 - Use a counter or score keeper in your game. 15 pts.
 - Must include a forever loop, show, hide, and "when I receive." 30 pts.

Core Paper IV: Semester IV: **DSC-4A Multimedia Systems and Applications**

Paper: BACS401

Theory: 60 Lectures

Unit-1

Multimedia: Introduction to multimedia, components, uses of multimedia, multimedia applications, virtual reality. **(15 Lectures)**

Unit-2

Text: Fonts & Faces, Using Text in Multimedia, Font Editing & Design Tools, Hypermedia & Hypertext. **(5 Lectures)**

Images: Still Images – bitmaps, vector drawing, 3D drawing & rendering, natural light & colors, computerized colors, color palettes, image file formats. **(5 Lectures)**
Sound: Digital Audio, MIDI Audio, MIDI vs Digital Audio, Audio File Formats. **(5 Lectures)**

Unit-3

Video: How video works, analog video, digital video, video file formats, video shooting and editing. **(5 Lectures)**
Animation: Principle of animations, animation techniques, animation file formats. **(5 Lectures)**
Internet and Multimedia: www and HTML, multimedia on the web – web servers, web browsers, web page makers and site builders. **(5 Lectures)**

Unit-4

Making Multimedia: Stages of a multimedia project, Requirements to make good multimedia, Multimedia Hardware - Macintosh and Windows production Platforms, Hardware peripherals - Connections, Memory and storage devices, Multimedia software and Authoring tools. **(15 Lectures)**

References:

1. Tay Vaughan, “Multimedia: Making it work”, TMH, Eighth edition.
2. Ralf Steinmetz and Klara Naharstedt, “Multimedia: Computing, Communications Applications”, Pearson.
3. Keyes, “Multimedia Handbook”, TMH.
4. K. Andleigh and K. Thakkar, “Multimedia System Design”, PHI.

Practical:

Paper: BACS201P

Practical exercises based on concepts listed in theory using Presentation tools in office automation tool/ GIMP/Blender / Audacity/ Animation Tools/ Image Editors/ Video Editors.

Implement the followings using Blender -

1. Create an animation using the tools panel and the properties panel to draw the following – Line, pe , oval, circle, rectangle , square, pencil , brush , lasso tool
2. Create an animation using text tool to set the font , size , color etc.
3. Create an animation using **Free transform tool** that should use followings-
Move Objects Skew
Objects
Stretch Objects Rotate
Objects
Stretch Objects while maintaining proportion
Rotate Objects after relocating the center dot
4. Create an animation using layers having following features- Insert layer, Delete layer, guide layer, Mask layer.
5. Modify the document (changing background color etc.)using the following tools
Eraser tool
Hand tool
Ink bottle tool
Zoom tool

- Paint Bucket tool
Eyedropper tool
6. Create an animation for bus car race in which both starts from the same point and car wins the race.
 7. Create an animation in which text Hello gets converted into GoodBye (using motion/shape tweening).
 8. Create an animation having five images having fade-in fade-out effect.
 9. Create an scene to show the sunrise (using multiple layers and motion tweening)
 10. Create an animation to show the ripple effect.
 11. Create an animation (using Shape tweening and shape hints) for transforming one shape into another.
 12. Create an animation for bouncing ball (you may use motion guide layer).

Semester V and VI : Any two papers from following five Discipline Specific Electives – (Credits : 06 each) - DSE – (4 Theory + 4 Lab)

Discipline Specific Elective 1:DSE-1A **Programming with Python**

Paper: BACS503

Theory: 60 Lectures

Unit-1

Planning the Computer Program: Concept of problem solving, Problem definition Program design, Debugging, Types of errors in programming, Documentation **(7 Lectures)**
Techniques of Problem Solving: Flowcharting, decision table, algorithms, Structured programming concepts, Programming methodologies viz. top-down and bottom-up programming **(8 Lectures)**

Unit-2

Overview of Programming: Structure of a Python Program, Elements of Python **(5 Lectures)**

Introduction to Python: Python Interpreter, Using Python as calculator, Python shell, Indentation. Atoms, Identifiers and keywords, Literals, Strings, Operators(Arithmetic operator, Relational operator, Logical or Boolean operator, Assignment, Operator, Ternary operator, Bit wise operator, Increment or Decrement operator) **(10 Lectures)**

Unit-3

Creating Python Programs: Input and Output Statements, Control statements (Branching, Looping, Conditional Statement, Exit function, Difference between break, continue and pass.), Defining Functions, default arguments, Errors and Exceptions. **(5 Lectures)**

Iteration and Recursion: Conditional execution, Alternative execution, Nested conditionals, The return statement, Recursion, Stack diagrams for recursive functions, Multiple assignment, The while statement, Tables, Two-dimensional tables **(5 Lectures)**

Strings and Lists: String as a compound data type, Length, Traversal and the for loop, String slices, String comparison, A find function, Looping and counting, List values, Accessing elements, List length, List membership, Lists and for loops, List operations, List deletion. Cloning lists, Nested lists **(5 Lectures)**

Unit-4

Object Oriented Programming: Introduction to Classes, Objects and Methods, Standard Libraries. **(7 Lectures)**

Data Structures: Arrays, list, set, stacks and queues. **(8 Lectures)**

References:

1. T. Budd, Exploring Python, TMH, 1st Ed, 2011
2. How to think like a computer scientist: learning with Python / Allen Downey, Jeffrey Elkner, Chris Meyers. 1st Edition – Freely available online.
1. <http://docs.python.org/3/tutorial/index.html>
2. <http://interactivepython.org/courselib/static/pythonds>

Practical:

Paper: BACS503P

1. Using for loop, print a table of Celsius/Fahrenheit equivalences. Let c be the Celsius temperatures ranging from 0 to 100, for each value of c, print the corresponding Fahrenheit temperature.
2. Using while loop, produce a table of sines, cosines and tangents. Make a variable x in range from 0 to 10 in steps of 0.2. For each value of x, print the value of sin(x), cos(x) and tan(x).
3. Write a program that reads an integer value and prints “leap year” or “not a leap year”.
4. Write a program that takes a positive integer n and then produces n lines of output shown as follows.
For example enter a size: 5
*
**

5. Write a function that takes an integer input and calculates the factorial of that number.

6. Write a function that takes a string input and checks if it's a palindrome or not.
7. Write a list function to convert a string into a list, as in list ('abc') gives [a, b, c].
8. Write a program to generate Fibonacci series.
9. Write a program to check whether the input number is even or odd.
10. Write a program to compare three numbers and print the largest one.
11. Write a program to print factors of a given number.
12. Write a method to calculate GCD of two numbers.
- 13.

Discipline Specific Elective 2:

DSE-1B Visual Programming

Paper: BACS504

Theory: 60 Lectures

Unit-1

Use any open source alternative such as Tkinter with Python /SharpDevelop/ /GAMBAS /OPENXAVA with JAVA **(7 Lectures)**

GUI Environment: Introduction to graphical user interface (GUI), programming Language (procedural, object oriented, event driven), the GUI environment, compiling, debugging, and running the programs. **(8 Lectures)**

Unit-2

Controls: Introduction to controls textboxes, frames, check boxes, option buttons, images, setting borders and styles, the shape control, the line control, working with multiple controls and their properties, designing the user interface, keyboard access, tab controls, default & cancel property, coding for controls. **(10 Lectures)**

Operations: Data types, constants, named & intrinsic, declaring variables, scope of variables, val function, arithmetic operations, formatting data. **(5 Lectures)**

Unit-3

Decision Making: If statement, comparing strings, compound conditions (and, or, not), nested if statements, case structure, using if statements with option buttons & check boxes, displaying message in message box, testing whether input is valid or not. **(7 Lectures)**

Modular programming: Menus, sub-procedures and sub-functions defining / creating and modifying a menu, using common dialog box, creating a new sub-procedure, passing variables to procedures, passing argument by value or by reference, writing a function/ procedure. **(8 Lectures)**

Unit-4

Forms Handling : Multiple forms creating, adding, removing forms in project, hide, show method, load, unload statement, me keyword, referring to objects on a different forms (5 Lectures)

Iteration Handling: Do/loops, for/next loops, using msgbox function, using string function (5 Lectures)

Arrays: Arrays - 1-dimension arrays, initializing an array using for each, user-defined data types (5 Lectures)

Reference Books:

1. Reference: Programming in Visual Basic 6.0 by Julia Case Bradley, Anita C. Millispangh (Tata Mcgraw Hill Edition 2000 (Fourteenth Reprint 2004))

Practical:

Paper: BACS504P

1. Print a table of numbers from 5 to 15 and their squares and Cubes.
2. Print the largest of three numbers.
3. Find the fractional of a number n.
4. Enter a list of positive numbers terminated by zero. Find the sum and average of these numbers.
5. A person deposits Rs. 1000 in a fixed account yielding 5% interest. Complete the amount in the account at the end of each year for n years.
6. Read n numbers. Count the number of negative numbers, positive numbers and zeros in the list.
7. Read n numbers. Count the number of negative numbers, positive numbers and zeroes in the list.use arrays.
8. Read a single dimension array. Find the sum and average of these numbers.
9. Read a two dimension array. Find the sum of two 2D Array.
10. Create a database Employee and Make a form to allow data entry to **Employee Form** with the following command buttons:

Employee Form

Employee Name:

Employee Id:

Date of Joining:

Designation:

Department:

Address:

Basic Pay:

PREV

FIRST

LAST

ADD

DELETE

SAVE

CANCEL

Discipline Specific Elective 3: **DSE-2A Information Security and Cyber Laws**

Paper: BACS604

Theory: 60 Lectures

Unit-1

Course Introduction: Computer network as a threat, hardware vulnerability, software vulnerability, importance of data security. **(10 Lectures)**

Digital Crime: Overview of digital crime, criminology of computer crime. **(5 Lectures)**

Unit-2

Information Gathering Techniques: Tools of the attacker, information and cyber warfare, scanning and spoofing, password cracking, malicious software, session hijacking **(5 Lectures)**

Risk Analysis and Threat: Risk analysis, process, key principles of conventional computer security, security policies, authentication, data protection, access control, internal vs external threat, security assurance, passwords, authentication, and access control, computer forensics and incident response **(10 Lectures)**

Unit-3

Introduction to Cryptography and Applications : Important terms, Threat, Flaw, Vulnerability, Exploit, Attack, Ciphers, Codes, Substitution Cipher (Caesar), Transposition Cipher (Rail-Fence), Public key cryptography (Definitions only), Private key cryptography (Definition and Example), Cyber forensics, Steganography **(15 Lectures)**

Unit-4

Safety Tools and Issues : Firewalls, logging and intrusion detection systems, Windows and windows XP / NT security, Unix/Linux security, ethics of hacking and cracking

Cyber laws to be covered as per IT 2008:

- Chapter 1: Definitions
- Chapter 2: Digital Signature And Electronic Signature
- [Section 43] Penalty and Compensation for damage to computer, computer system, etc.
- [Section 65] Tampering with Computer Source Documents
- [Section 66 A] Punishment for sending offensive messages through communication service, etc.
- [Section 66 B] Punishments for dishonestly receiving stolen computer resource or communication device
- [Section 66C] Punishment for identity theft
- [Section 66D] Punishment for cheating by personation by using computer resource
- [Section 66E] Punishment for violation of privacy
- [Section 66F] Punishment for cyber terrorism
- [Section 67] Punishment for publishing or transmitting obscene material in electronic form
- [Section 67A] Punishment for publishing or transmitting of material containing sexually explicit act, etc. in electronic form
- [Section 67B] Punishment for publishing or transmitting of material depicting children in sexually explicit act, etc. in electronic form
- [Section 72] Breach of confidentiality and privacy **(15 Lectures)**

Reference Books:

1. M. Merkow, J. Breithaupt, Information Security Principles and Practices, Pearson Education.
2. G.R.F. Snyder, T. Pardoe, Network Security, Cengage Learning, 2010
3. A. Basta, W.Halton, Computer Security: Concepts, Issues and Implementation, Cengage Learning India, 2008
4. Anderson, Ross. Security engineering. John Wiley & Sons, 2008. (Freely available online)

Practical:

Paper: BACS604P

1. Demonstrate the use of Network tools: ping, ipconfig, ifconfig, tracert, arp, netstat, whois

2. Use of Password cracking tools: John the Ripper, Ophcrack. Verify the strength of passwords using these tools.
3. Perform encryption and decryption of Caesar cipher. Write a script for performing these operations.
4. Demonstrate sending of a digitally signed document.
5. Demonstrate sending of a protected worksheet.
6. Demonstrate use of steganography tools.
7. Demonstrate use of gpg utility for signing and encrypting purposes.
- 8.

Discipline Specific Elective 4: **DSE-2B Software Engineering**

Paper: BACS605

Theory: 60 Lectures

Software Engineering

Theory: 60 Lectures

Unit 1:

Introduction to Software Engineering, Software Engineering as a Layered Technology, Software Life Cycle Models **(15 Lectures)**

Unit 2:

Software Requirements: Analysis and Specifications, Software Requirement Analysis, Initiating Requirement Engineering Process, Requirement Analysis and Modeling Techniques, Flow Oriented Modeling, Need for SRS, Characteristics and Components of SRS. **(15 Lectures)**

Unit 3:

Software Project Planning and Design: Estimation in Project Planning Process, Project Scheduling, Design Concepts, Architectural Design Elements, Software Architecture, Data Design at the Architectural Level and Component Level, Mapping of Data Flow into Software Architecture, Modeling Component Level Design **(15 Lectures)**

Unit 4:

Software Metrics, Software Testing, Software Testing Fundamentals, Strategic Approach to Software Testing, Test Strategies for Conventional Software, Validation Testing, System testing, Black-Box Testing, White-Box Testing and their type, Basis Path Testing. Software Maintenance, Software Certification **((15 Lectures)**

Recommended Books:

1. K.K. Aggarwal and Y. Singh, Software Engineering (3rd Edition), New Age International Publishers, 2011.

2. Yogesh Singh, Software Testing, Cambridge University Press, 2011.
3. R.S. Pressman, Software Engineering: A Practitioner's Approach (7th Edition), McGraw-Hill, 2009.

Practical:

Paper: BACS605P

Practical exercises based on concepts listed in theory.

S. No	Practical Title
1.	<ul style="list-style-type: none"> • Problem Statement, • Process Model
2.	Requirement Analysis: <ul style="list-style-type: none"> • Creating a Data Flow • Data Dictionary, Use Cases • Survey/Interview Questionnaire
3.	Design Engineering: <ul style="list-style-type: none"> • Architectural Design / Front End using HTML • DataBase Design

Sample Projects:

1. **Criminal Record Management** : Implement a criminal record management system for jailers, police officers and CBI officers
2. **DTC Route Information**: Online information about the bus routes and their frequency and fares
3. **Car Pooling**: To maintain a web based intranet application that enables the corporate employees within an organization to avail the facility of carpooling effectively.
4. Patient Appointment and Prescription Management System
5. Organized Retail Shopping Management Software
6. Online Hotel Reservation Service System
7. Examination and Result computation system
8. Automatic Internal Assessment System
9. Parking Allocation System
10. Wholesale Management System

Skill Enhancement Courses (any four) (Credit: 02 each) – SEC1 to SEC4– (Credits: 04 - (3Theory + 2 Lab/1 Tutorial)

Semester III

1. SEC-1 Office Automation Tools

Paper: BACS302

Theory: 45 Lectures

Unit 1: Document Editor - Mail merge with E-mail address lists /Databases (12 Lectures)

Unit 2: Spreadsheet – Referencing, Relative, Absolute and Mixed (11 Lectures)

Unit 3: Various charts in detail, VLOOKUP, HLOOKUP, Pivot Table (11 Lectures)

Unit 4: Use of E-mail clients – MS Outlook, Mozilla Thunderbird- Installation and Configuration (11 Lectures)

References:

- User manuals.

Practical:

Paper: BACS302P

Exercises based on tools listed in theory plus any other tool helpful in office automation.

Semester IV

2. SEC-2 Search Engine Optimization

Paper: BACS402

Theory: 45 Lectures

<p>Unit 1: Domain, Portal and search engine, SEO, Types of SEO, Black Hat, White Hat</p>	(12 Lectures)
<p>Unit 2: Introduction to Search Engines – Working, Examples, Google, Yahoo, Bing, AltaVista etc.</p>	(11 Lectures)
<p>Unit 3: On Page optimization – Meta description and meta keywords, Headings, Bold Text, Domain names and suggestions, Canonical tag, Meta tags, Images and alt, Internal link, sitemap, Invisible text, SWOT analysis</p>	(11 Lectures)
<p>Unit 4: Off Page Optimization – Page Rank, Link Popularity, Link Building, Directory, Social bookmarks, Blog Submission</p>	(11 Lectures)

References:

Google and other online Manuals

Practical:

Paper: BACS402P

- Complete a project to build five-page website and perform all SEO activities on it.
- Open two/ three websites on similar domain (such as telecom, FMCG) and compare their on-page SEO optimizations. Perform SWOT analysis and Suggest improvements.

Semester V (SEC-3A or SEC-3B)

3. SEC-3A Open Source Software

Paper: BACS501

Theory: 45 Lectures

<p>Unit 1: The philosophy of OSS, commercial software vs OSS, free software vs freeware.</p>	(12 Lectures)
<p>Unit 2: The Linux operating system, GPL, LGPL and other licenses</p>	(11 Lectures)
<p>Unit 3: Category of OSS Application Software</p>	(11 Lectures)
<p>Unit 4: Study of Commercial Application software vs OSS, Open Office, GAMBAS, GIMP etc.</p>	(11 Lectures)

References:

Understanding Open Source and Free Software Licensing – O'Reilly Media, 2011

Practical:

Paper: BACS501P

- Find out various Open source software for the concepts studied by you till now.
- Install the software like Open office, MySQL etc. and perform comparative study of their salient features.
- Use GIMP for Image Editing
- Use GAMBAS for creating Admission Forms
- Use GAMBAS for creating Exam Marksheet

4. SEC-3B Introduction to Linux

Paper: BACS502

Theory: 45 Lectures

Unit 1: Basic overview and history of unix/linux, Command line basics	(12 Lectures)
Unit 2: Commands: ssh, ls, pwd, cd, cp, rm, mv, mkdir, nano, cat, head, tail, less, clear, grep, sort, uniq, man, >, , ssh-keygen	(11 Lectures)
Unit 3: OS basics, processes, File permissions, Commands: chmod, find, locate	(11 Lectures)
Unit 4: Overview of popular Linux distributions, Running Linux in a virtual machine, Installing applications, Commands: make, apt-get	(11 Lectures)

References :

<http://www.ee.surrey.ac.uk/Teaching/Unix/>
<http://linux-training.be/files/books/LinuxFun.pdf>

Practical:

Paper: BACS502P

1. Demonstrate use of basic linux commands listed in theory.
2. Install java and Perl on a Linux machine.

Semester VI (SEC-4A or SEC-4B or SEC-4C)

5. SEC-4A Web Design using HTML5

Paper: BACS601

Theory: 45 Lectures

Unit 1: Review of Basic HTML Tags	(12 Lectures)
Unit 2: Handling Forms	(11 Lectures)
Unit 3: Managing Text Flow and Graphical Interface using CSS	(11 Lectures)
Unit 4: Adding Multimedia and Interactivity	(11 Lectures)

References:

1. Head First HTML5 Programming (English) 1st Edition – O’Reilly Media, 2012
2. HTML5: Up And Running (English) – O’Reilly Media, 2010.

Practical:

Paper: BACS601P

- Create your own CSS files with custom styles.
- Demonstrate the use of these styles in various web pages -Demonstrate the use of audio in HTML5.
- Demonstrate the use of video in HTML5.
- Demonstrate the HTML5 form with text flow management.

6. SEC-4B PHP Programming

Paper: BACS602

Theory: 45 Lectures

Unit 1: Design and write PHP programs – Basic PHP syntax, structure and coding techniques, variables, constants, expressions and operators	(12 Lectures)
Unit 2: Use of arrays, string, numbers, built-in functions and global variables.	(11 Lectures)
Unit 3: Use PHP to send email, upload files dynamically	(11 Lectures)
Unit 4: MySQL Database- setup, connection, insert, update, delete, display records	(11 Lectures)

References:

1. Steven Holzner, "PHP: The Complete Reference Paperback", McGraw Hill Education (India), 2007.
2. Timothy Boronczyk, Martin E. Psinas, "PHP and MYSQL (Create-Modify-Reuse)", Wiley India Private Limited, 2008.
3. Robin Nixon, "Learning PHP, MySQL, JavaScript, CSS & HTML5", 3rd Edition Paperback, O'reilly, 2014.
4. Luke Welling, Laura Thompson, "PHP and MySQL Web Development", 4th Edition, Addition Paperback, Addison-Wesley Professional, 2008.
5. David Sklar, Adam Trachtenberg, "PHP Cookbook: Solutions & Examples for PHP Programmers", 2014.

Practicals:

Paper: BACS602P

1. Write a program to find greatest of three numbers.
2. Write a program to find gross salary of a person
3. Write a program to find grade of a student given his marks.
4. Write a program to find divisor or factorial of a given number.
5. Write a program to print first ten natural numbers.
6. Write a program to print first ten even and odd numbers.

7. SEC-4C Programming using C/C++

Paper: BACS603

Theory: 45 Lectures

Unit 1: Programming using C: C primitive input output, simple I/O, Function calls from library , data type in C,	(12 Lectures)
Unit 2: Arithmetic, relational and logical operations, Conditional executing using if, else, switch and break	(11 Lectures)
Unit 3: Concept of loops , for, while and do-while ,	(11 Lectures)
Unit 4: Introduction to Arrays (one and two dimensional)	(11 Lectures)

References:

1. Kernighan & Ritchie, “C Programming Language”,
The (Ansi C version), PHI, 2/e,1992
2. K.R Venugopal, “Mastering C ”, TMH, 2006

Practicals :

Paper: BACS603P

1. Write a program to find greatest of three numbers.
2. Write a program to find gross salary of a person
3. Write a program to find grade of a student given his marks.
4. Write a program to find divisor or factorial of a given number.
5. Write a program to print first ten natural numbers.
6. Write a program to print first ten even and odd numbers.
7. Write a program to find grade of a list of students given their marks.

**General Elective Papers for students of other disciplines –
GE1 and GE2 – (Credits: 06) - (4 + 4 Lab)**

General Elective : GE-1 : IT Fundamentals

Paper: BACS505

Theory: 60 Lectures

Unit 1:

Introduction: Introduction to logical organization of computer, input and output devices (with connections and practical demo), keyboard, mouse, joystick, scanner, OCR, OMR, monitor, printer, plotter, primary memory, secondary memory, auxiliary memory. **(15 Lectures)**

Unit 2:

User Interface: Operating system as user interface, system tools, utility programs **(7 Lectures)**

Database: Introduction to database, relational data model, Entity types, entity set, attribute and key, relationships, relation types, SQL queries: select, from, where, order **(8 Lectures)**

Unit 3:

Networks: Definition of network, classification of network, LAN, MAN, WAN, distinction among the networks, Guided Media: Twisted pair, Coaxial cable, and Optical fiber. Unguided media: Microwave, Radio frequency propagation, Satellite, LAN Topologies: Ring, bus, star, mesh and tree topologies. **(15 Lectures)**

Unit 4:

Internet Applications: Internet as a global network, Search Engine, Online education, Internet utilities – email, online banking, reservations etc. **(8 Lectures)**

Use of Computers in Education and Research: Data analysis, Heterogeneous storage, e-Library, Google Scholar, Domain specific packages such as SPSS, Mathematica etc. **(7 Lectures)**

Reference Books:

1. A. Goel, Computer Fundamentals, Pearson Education, 2010.
2. P. Aksoy, L. DeNardis, Introduction to Information Technology, Cengage Learning, 2006
3. P. K.Sinha, P. Sinha, Fundamentals of Computers, BPB Publishers, 2007

Practical:

Paper: BACS505P

Practical exercises based on Open Office/ MS Office tools using document preparation, spreadsheet handling packages and presentation software.

MS Word

1. Prepare a **grocery list** having four columns (Serial number, The name of the product, quantity and price) for the month of April, 06.
 - Font specifications for Title (Grocery List): 14-point Arial font in bold and italics.
 - The headings of the columns should be in 12-point and bold.
 - The rest of the document should be in 10-point Times New Roman.
 - Leave a gap of 12-points after the title.
2. Create a **telephone directory**.
 - The heading should be 16-point Arial Font in bold • The rest of the document should use 10-point font size
 - Other headings should use 10-point Courier New Font.
 - The footer should show the page number as well as the date last updated.
3. Design a **time-tableform** for your college.

- The first line should mention the name of the college in 16-point Arial Font and should be bold.
- The second line should give the course name/teacher's name and the department in 14-point Arial.
- Leave a gap of 12-points.
- The rest of the document should use 10-point Times New Roman font.
- The footer should contain your specifications as the designer and date of creation. 4.
BPB Publications plans to release a new book designed as per your syllabus. Design the **first page of the book** as per the given specifications.
- The title of the book should appear in bold using 20-point Arial font.
- The name of the author and his qualifications should be in the center of the page in 16-point Arial font.
- At the bottom of the document should be the name of the publisher and address in 16-point Times New Roman.
- The details of the offices of the publisher (only location) should appear in the footer.

5. Create the following one page documents.

- Compose a note inviting friends to a get-together at your house, Including a list of things to bring with them.
- Design a certificate in landscape orientation with a border around the document.

6. Create the following documents:

- A newsletter with a headline and 2 columns in portrait orientation, including at least one image surrounded by text.
- Use a newsletter format to promote upcoming projects or events in your classroom or college.

7. Convert following text to a table, using comma as delimiter

Type the following as shown (do not bold).

Color, Style, Item
Blue, A980, Van
Red, X023, Car
Green, YL724, Truck
Name, Age, Sex
Bob, 23, M
Linda, 46, F
Tom, 29, M

8. Enter the following data into a table given on the next page.

Salesperson Dolls Trucks Puzzles

Kulbhushan	1327	1423	1193
Vidya	1421	3863	2934
Parmaod	5214	3247	5467
Gurmeet	2190	1278	1928
Afsar	1201	2528	1203
Atwater, Kelly	4098	3079	2067

Add a column Region (values: S, N, N,S,S,S) between the Salesperson and Dolls columns to the given table
Sort your table data by Region and within Region by Salesperson in ascending order:

9. In this exercise, you will add a new row to your table, place the word "Total" at the bottom of the Salesperson column, and sum the Dolls, Trucks, and Puzzles columns.

10. Wrapping of text around the image.

11. Following features of menu option must be covered

- FILE Complete menu
- EDIT Complete menu
- VIEW Complete menu
- INSERT Complete menu
- FORMAT Complete menu
- TABLE Complete menu WINDOW Complete menu
- HELP Complete menu
- TOOLS All options except Online collaboration, Tools on Macro, Templates

MS Excel

1. Enter the Following data in Excel Sheet

REGIONAL SALES PROJECTION

State	Qtr1	Qtr2	Qtr3	QTR4	Total	Rate	Amount
Delhi	2020	2400	2100	3000			15
Punjab	1100	1300	1500	1400			20
U.P.	3000	3200	2600	2800			17
Harayana	1800	2000	2200	2700			15
Rajasthan	2100	2000	1800	2200			20

TOTAL

AVERAGE

(a) Apply Formatting as follow: Title in

TIMES NEW ROMAN

Font Size - 14

Remaining text - ARIAL, Font Size -10

State names and Qtr. Heading Bold, Italic with Gray Fill Color.

Numbers in two decimal places.

Qtr. Heading in center Alignment.

Apply Border to whole data.

(b) Calculate State and Qtr. Total (c)

Calculate Average for each quarter

(d) Calculate Amount = Rate * Total.

2. Given the following worksheet

	A	B	C	D
1	Roll No.	Name	Marks	Grade
2	1001	Sachin		99
3	1002	Sehwag		65
4	1003	Rahul		41
5	1004	Sourav		89
6	1005	Har Bhajan		56

Calculate the grade of these students on the basis of following guidelines:

If Marks	Then Grade
>= 80	A+

$\geq 60 < 80$	A
$\geq 50 < 60$	B
< 50	F

3. Given the following worksheet

	A	B	C	D	E	F	G
1	Salesman		Sales in (Rs.)				
2	No.	Qtr1	Qtr2	Qtr3	Qtr4	Total	Commission
3	S001	5000	8500	12000	9000		
4	S002	7000	4000	7500	11000		
5	S003	4000	9000	6500	8200		
6	S004	5500	6900	4500	10500		
7	S005	7400	8500	9200	8300		
8	S006	5300	7600	9800	6100		

Calculate the commission earned by the salesmen on the basis of following Candidates:

If Total Sales	Commission
< 20000	0% of sales
> 20000 and < 25000	4% of sales
> 25000 and < 30000	5.5% of sales
> 30000 and < 35000	8% of sales
≥ 35000	11% of sales

The total sales is sum of sales of all the four quarters.

4. A company XYZ Ltd. pays a monthly salary to its employees which consists of basic salary, allowances & deductions. The details of allowances and deductions are as follows :

Allowances

- HRA Dependent on Basic
 - 30% of Basic if Basic ≤ 1000
 - 25% of Basic if Basic > 1000 & Basic ≤ 3000
 - 20% of Basic if Basic > 3000
- DA Fixed for all employees, 30% of Basic
- Conveyance Allowance Rs. 50/- if Basic is ≤ 1000
Rs. 75/- if Basic > 1000 & Basic ≤ 2000 Rs. 100 if Basic > 2000
- Entertainment Allowance NIL if Basic is ≤ 1000
Rs. 100/- if Basic > 1000

Deductions

- Provident Fund 6% of Basic
- Group Insurance Premium
- Rs. 40/- if Basic is ≤ 1500
- Rs. 60/- if Basic > 1500 & Basic ≤ 3000
- Rs. 80/- if Basic > 3000

Calculate the following:

Gross Salary = Basic + HRA + DA + Conveyance + Entertainment

Total deduction = Provident Fund + Group Insurance Premium Net Salary = Gross

Salary – Total Deduction

5. Create Payment Table for a fixed Principal amount, variable rate of interests and time in the format below :

No. of Instalments	5%	6%	7%	8%	9%
3	XX	XX	XX	XX	XX
4	XX	XX	XX	XX	XX
5	XX	XX	XX	XX	XX
6	XX	XX	XX	XX	XX

6. Use an array formula to calculate Simple Interest for given principal amounts given the rate of Interest and time

Rate of Interest	8%
Time	5 Years
Principal	Simple Interest
1000	? 18000 ?
5200	?

7. The following table gives an year wise sale figure of five salesmen in Rs.

Salesman	2000	2001	2002	2003
S1	10000	12000	20000	50000
S2	15000	18000	50000	60000
S3	20000	22000	70000	70000
S4	30000	30000	100000	80000
S5	40000	45000	125000	90000

- Calculate total sale year wise.
- Calculate the net sale made by each salesman
- Calculate the maximum sale made by the salesman
- Calculate the commission for each salesman under the condition.
 - If total sales >4,00,000 give 5% commission on total sale made by the salesman.
 - Otherwise give 2% commission.
- Draw a bar graph representing the sale made by each salesman.
- Draw a pie graph representing the sale made by salesman in 2000.

8. Enter the following data in Excel Sheet

PERSONAL BUDGET FOR FIRST QUARTER

Monthly Income (Net) : 1,475

EXPENSES	JAN	FEB	MARCH	QUARTER TOTAL	QUARTER AVERAGE
Rent	600.00	600.00			
Telephone	48.25	43.50	60.00		
Utilities	67.27	110.00	70.00		
Credit Card	200.00	110.00	70.00		
Oil	100.00	150.00	90.00		
AV to Insurance	150.00				
Cable TV	40.75	40.75	40.75		
Monthly Total					

- Calculate Quarter total and Quarter average.
- Calculate Monthly total.
- Surplus = Monthly income - Monthly total.
- What would be total surplus if monthly income is 1500.
- How much does telephone expense for March differ from quarter average.

- (f) Create a 3D column graph for telephone and utilities.
- (g) Create a pie chart for monthly expenses.

9. Enter the following data in Excel Sheet

TOTAL REVENUE EARNED FOR SAM'S BOOKSTALL

Publisher name	1997	1998	1999	2000	total
A	Rs. 1,000.00	Rs. 1100.00	Rs. 1,300.00	Rs. 800.00	
B	Rs. 1,500.00	Rs. 700.00	Rs. 1,000.00	Rs. 2,000.00	
C	Rs. 700.00	Rs. 900.00	Rs. 1,500.00	Rs. 600.00	
D	Rs. 1,200.00	Rs. 500.00	Rs. 200.00	Rs. 1,100.00	
E	Rs 800.00	Rs. 1,000.00	Rs. 3,000.00	Rs. 560.00	

- (a) Compute the total revenue earned.
- (b) Plot the line chart to compare the revenue of all publisher for 4 years.
- (b) Chart Title should be 'Total Revenue of sam's Bookstall (1997-2000)'
- (c) Give appropriate categories and value axis title.

10. Generate 25 random numbers between 0 & 100 and find their sum, average and count. How many no. are in range 50-60

11. Create at least 5 presentations on various topics such as College festival, Countryside, College tour etc.

General Elective:
GE-2 : Multimedia and Web Design
Paper: BACS606

Theory: 60 Lectures

Unit 1:

Multimedia : Definition, Components, uses, applications (**15 Lectures**)

Unit 2:

Multimedia Input/Output Devices: scanner, camera, microphone, speaker, monitors, printers. (**8 Lectures**)

Multimedia Storage Devices: CD ROMs, DVDs, Blue ray disk. (**7 Lectures**)

Unit 3:

Multimedia Tools: Sound editor, video editor, animator, authoring tools. (**8 Lectures**)

Web Designing: Concept of website, website as a communication resource. Internet, intranet and extranet, basic concepts related to website designing. (**7 Lectures**)

Unit 4:

HTML: Introduction to hypertext markup language (html) document type definition, creating web pages, graphical elements, lists, hyperlinks, tables, web forms, inserting images, frames, use of CSS (**15 Lectures**)

Reference Books:

1. Scott Mitchell , Create your own website , SAMS Publication , 2008
2. Tay Vaughan, Multimedia : Making it work, Tata McGraw Hill, Seventh edition, 2006
3. J. Jeffcoate, Multimedia in Practice, Pearson Education, First Edition, 2007

Practical:

Paper: BACS606P2

Practical exercises based on Open Office tools using presentation software, web design and development tools, image editing tools (Gimp) and animation tools such as Blender

1. Create an HTML document with the following formatting options:
 - I. Bold
 - II. Italics
 - III. Underline
 - IV. Headings (Using H1 to H6 heading styles)
 - V. Font (Type, Size and Color)
 - VI. Background (Colored background/Image in background)
 - VII. Paragraph
 - VIII. Line Break
 - IX. Horizontal Rule
 - X. Pre tag
2. Create an HTML document which consists of:
 - I. Ordered List
 - II. Unordered List
 - III. Nested List
 - IV. Image

Optional

Implement the followings using Blender -

1. Create an animation using the tools panel and the properties panel to draw the following – Line, pe
, oval, circle, rectangle , square, pencil , brush , lasso tool
2. Create an animation using text tool to set the font , size , color etc.
3. Create an animation using **Free transform tool** that should use followings-
Move Objects Skew
Objects
Stretch Objects Rotate
Objects
Stretch Objects while maintaining proportion
Rotate Objects after relocating the center dot
4. Create an animation using layers having following features- Insert layer, Delete layer, guide layer,
Mask layer.
5. Modify the document (changing background color etc. using the following tools
Eraser tool
Hand tool
Ink bottle tool Zoom
tool
Paint Bucket tool Eyedropper
tool
6. Create an animation for bus car race in which both starts from the same point and car wins the race.
7. Create an animation in which text Hello gets converted into GoodBye (using motion/shape
tweening).
8. Create an animation having five images having fade-in fade-out effect.
9. Create an scene to show the sunrise (using multiple layers and motion tweening)
10. Create an animation to show the ripple effect.
11. Create an animation (using Shape tweening and shape hints) for transforming one shape into
another.
12. Create an animation for bouncing ball (you may use motion guide layer).